

Self-Assembly of Nanocomposite Nonlinear Optical Materials for Photonic Devices, Phase I

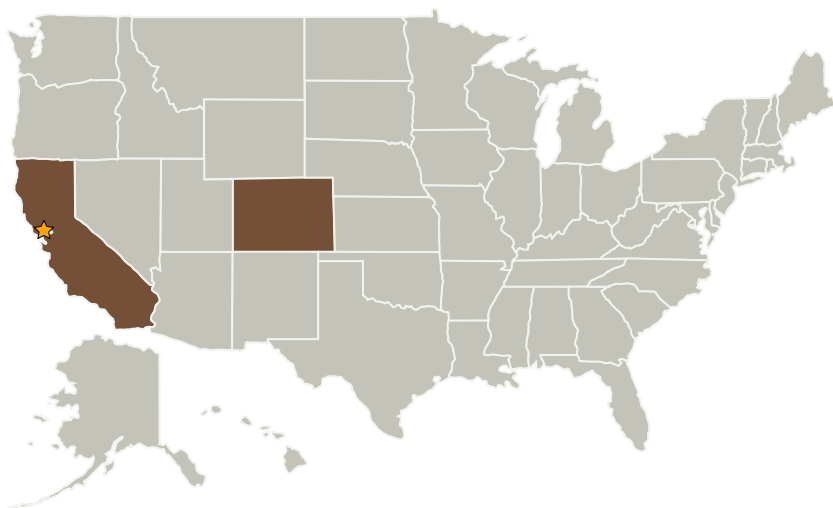
Completed Technology Project (2004 - 2004)



Project Introduction

This program targets the development of new highly anisotropic nonlinear optical nanocomposite materials for NASA and non-NASA applications in advanced photonic and optoelectronic devices and optical integrated circuits. Integration of electronic and optical components onto a single platform is becoming essential to advancing sensor, computational, memory, and communications technologies. Designing optical and electronic materials from the molecular scale up is expected to result in a new era of complex materials exhibiting enhanced optical properties, low processing costs, and substrate compatibility to enable device-on-a-chip technologies. The nonlinear optical materials for development in this program will be composed of complex nanocomposite heterostructures produced by molecular self-assembly derived from a well-characterized family of quasi one-dimensional electronic materials with chemically tunable optical properties and dynamics. These materials can be grown as single crystals or oriented thin films at low temperatures without epitaxial growth making their production low cost and platform-independent. These materials have intimately coupled optical and electronic activity and are transparent over much of the electromagnetic spectrum making them well suited for optoelectronic devices. The highly anisotropic and low-dimensional nature of these materials also provides highly oriented optoelectronic responses and quantum confinement effects that are desirable in advanced micro-optoelectronic devices.

Primary U.S. Work Locations and Key Partners



Self-Assembly of Nanocomposite Nonlinear Optical Materials for Photonic Devices, Phase I

Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Organizational Responsibility	1
Project Management	2
Technology Areas	2

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Self-Assembly of Nanocomposite Nonlinear Optical Materials for Photonic Devices, Phase I

Completed Technology Project (2004 - 2004)



Organizations Performing Work	Role	Type	Location
★ Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
Eltron Research & Development, Inc.	Supporting Organization	Industry	Boulder, Colorado

Primary U.S. Work Locations

California	Colorado
------------	----------

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Wayne E Buschmann

Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
 - └ TX12.1 Materials
 - └ TX12.1.7 Special Materials